What is claimed is:

1. A system for automatically correcting flight path of an aircraft onto a predetermined trajectory, the system comprising:

a sensor configured to sense speed of air relative to an aircraft at a predetermined distance in front of the aircraft;

a navigation system configured to determine displacement of flight path of the aircraft from a predetermined trajectory; and

a processor coupled to receive the sensed speed of air from the sensor and the displacement of the flight path from the navigation system, the processor including:

a first component configured to determine whether the speed of the air at the predetermined distance is indicative of turbulence; and

a second component configured to automatically generate control signals to correct the flight path of the aircraft from the displacement onto the predetermined trajectory by a time when the aircraft enters the turbulence.

2. The system of Claim 1, wherein the second component automatically generates the control signals responsive to the indication of turbulence.

3. The system of Claim 2, wherein the second component automatically generates the control signals further responsive to the displacement of the flight path.

4. The system of claim 3, wherein the displacement of the flight path includes a position error component.

5. The system of Claim 1, wherein the sensor includes an optical sensor.

6. The system of Claim 5, wherein the optical sensor includes a laser.

7. The system of Claim 6, wherein the laser includes a laser Doppler velocimeter system.

8. The system of Claim 1, wherein the predetermined distance is less than around 1,000 meters.

9. The system of Claim 8, wherein the predetermined distance is around 100 feet.

10. The system of Claim 1, wherein the aircraft includes an unmanned aircraft.

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11. The system of Claim 10, wherein the unmanned aircraft includes a rocket propelled vehicle.

12. The system of Claim 11, wherein the rocket propelled vehicle includes a missile.

13. The system of Claim 10, wherein the unmanned aircraft includes a drone.

14. A method for automatically correcting flight path of an aircraft onto a predetermined trajectory, the method comprising:

sensing speed of air relative to an aircraft at a predetermined distance in front of the aircraft;

determining whether the speed of the air at the predetermined distance is indicative of turbulence;

determining displacement of a flight path of the aircraft from a predetermined trajectory; and

automatically correcting the flight path of the aircraft from the displacement onto the predetermined trajectory by a time when the aircraft enters the turbulence.

15. The method of Claim 14, wherein automatically correcting the light path includes automatically generating control signals.

16. The method of Claim 15, wherein the control signals are generated responsive to the indication of turbulence.

17. The method of claim 16, wherein the control signals are further generated responsive to the displacement of the flight path.

18. The method of Claim 17, wherein the displacement of the flight path includes a position error component.

19. The method of Claim 14, wherein automatically correcting the flight path includes automatically positioning control surfaces.

20. The method of Claim 14, wherein the speed of the air is sensed by an optical sensor.

21. The method of Claim 20, wherein the optical sensor includes a laser.

22. The method of Claim 21, wherein the laser includes a laser Doppler velocimeter system.

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23. The method of Claim 14, wherein the predetermined distance is less than around 1,000 meters.

24. The method of Claim 23, wherein the predetermined distance is around 100 feet.

25. The method of Claim 14, wherein the aircraft includes an unmanned aircraft.

26. The method of Claim 25, wherein the unmanned aircraft includes a rocket propelled vehicle.

27. The method of Claim 26, wherein the rocket propelled vehicle includes a missile.

28. The method of Claim 25, wherein the unmanned aircraft includes a drone.

29. A system for automatically correcting flight path of an aircraft onto a predetermined trajectory, the system comprising:

an optical sensor configured to sense speed of air relative to an aircraft at a predetermined distance in front of the aircraft;

a navigation system configured to determine displacement of flight path of the aircraft from a predetermined trajectory; and

a processor coupled to receive the sensed speed of air from the sensor and the displacement of the flight path from the navigation system, the processor including:

a first component configured to determine whether the speed of the air at the predetermined distance is indicative of turbulence; and

a second component configured to automatically generate control signals responsive to the indication of turbulence and further responsive to the displacement of the flight path to correct the flight path of the aircraft from the displacement onto the predetermined trajectory by a time when the aircraft enters the turbulence.

30. The system of Claim 29, wherein the displacement of the flight path includes a position error component.

31. The system of Claim 29, wherein the optical sensor includes a laser.

32. The system of Claim 31, wherein the laser includes a laser Doppler velocimeter system.

33. The system of Claim 29, wherein the predetermined distance is less than around 1,000 meters.

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What is claimed is:

1. A system for automatically compensating control of an aircraft for an environmental condition, the system comprising:

a sensor configured to sense speed of air relative to an aircraft at a predetermined distance in front of the aircraft; and

a processor coupled to receive the sensed speed of air from the sensor, the processor including:

a first component configured to determine whether the speed of the air at the predetermined distance is indicative of an environmental condition; and

a second component configured to automatically generate control signals for controlling the aircraft such that the environmental condition is automatically compensated by a time the aircraft enters the environmental condition.

2. The system of Claim 1, wherein the environmental condition includes turbulence.

3. The system of Claim 2, wherein the predetermined distance is less then 1,000 meters.

4. The system of Claim 3, wherein the predetermined distance is around 200 feet.

5. The system of Claim 1, wherein the environmental condition includes wind shear.

6. The system of Claim 5, wherein the wind shear includes a microburst.

7. The system of Claim 5, wherein the predetermined distance is greater than 1,000 meters.

8. The system of Claim 7, wherein the predetermined distance is around 10,000 meters.

9. The system of Clam 1, wherein the control signals automatically cause flight control surfaces to be positioned to compensate for the environmental condition by the time the aircraft enters the environmental condition.

10. The system of Claim 5, wherein the control signals automatically cause engine thrust to be increased to compensate for wind shear by the time the aircraft enters the wind shear.

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11. The system of Claim 1, wherein the sensor includes an optical sensor.

12. The system of Claim 11, wherein the optical sensor includes a laser.

13. The system of Claim 12, wherein the laser includes a laser Doppler velocimeter system.

14. A method for automatically compensating control of an aircraft for an environmental condition, the method comprising:

sensing speed of air relative to an aircraft at a predetermined distance in front of the aircraft;

determining whether the speed of the air at the predetermined distance is indicative of an environmental condition; and

automatically compensating control of the aircraft by a time the aircraft enters the environmental condition.

15. The method of Claim 14, wherein automatically compensating control of the aircraft includes automatically generating control signals.

16. The method of Claim 14, wherein the environmental condition includes turbulence.

17. The method of Claim 16, wherein the predetermined distance is less then 1,000 meters.

18. The method of Claim 17, wherein the predetermined distance is around 200 feet.

19. The method of Claim 14, wherein the environmental condition includes wind shear.

20. The method of Claim 19, wherein the wind shear includes a microburst.

21. The method of Claim 19, wherein the predetermined distance is greater than 1,000 meters.

22. The method of Claim 21, wherein the predetermined distance is around 10,000 meters.

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23. The method of Claim 14, wherein automatically compensating control of the aircraft includes automatically positioning control surfaces to compensate for the environmental condition by the time the aircraft enters the environmental condition.

24. The method of Claim 19, wherein automatically compensating control of the aircraft includes automatically increasing engine thrust to compensate for wind shear by the time the aircraft enters the wind shear.

25. The method of Claim 14, wherein the speed of the air is sensed by an optical sensor.

26. The method of Claim 25, wherein the optical sensor includes a laser.

27. The method of Claim 26, wherein the laser includes a laser Doppler velocimeter system.

28. A system for automatically compensating control of an aircraft for turbulence, the system comprising:

an optical sensor configured to sense speed of air relative to an aircraft at a predetermined distance in front of an aircraft; and

a processor coupled to receive the sensed speed of air from the optical sensor, the processor including:

a first component configured to determine whether the speed of the air at the predetermined distance is indicative of turbulence; and

a second component configured to automatically generate control signals for controlling the aircraft such that the turbulence is automatically compensated by a time the aircraft enters the turbulence.

29. The system of Claim 28, wherein the predetermined distance is less then 1,000 meters.

30. The system of Claim 29, wherein the predetermined distance is around 200 feet.

31. The system of Claim 28, wherein the control signals automatically cause flight control surfaces to be positioned to compensate for the turbulence by the time the aircraft enters the turbulence.

32. The system of Claim 28, wherein the optical sensor includes a laser.

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33. The system of Claim 32, wherein the laser includes a laser Doppler velocimeter system.

34. A method for automatically compensating control of an aircraft for turbulence, the method comprising:

optically sensing speed of air relative to an aircraft at a predetermined distance in front of the aircraft;

determining whether the speed of the air at the predetermined distance indicative of turbulence; and

automatically compensating control of the aircraft by a time the aircraft enters the turbulence.

35. The method of Claim 34, wherein automatically compensating control of the aircraft includes automatically generating control signals.

36. The method of Claim 34, wherein the predetermined distance is less then 1,000 meters.

37. The method of Claim 36, wherein the predetermined distance is around 200 feet.

38. The method of Claim 34, wherein automatically compensating control of the aircraft includes automatically positioning control surfaces to compensate for the turbulence by the time the aircraft enters the turbulence.

39. The method of Claim 34, wherein the speed of the air is optically sensed by a laser.

40. The method of Claim 39, wherein the laser includes a laser Doppler velocimeter system.

41. A system for automatically compensating control of an aircraft for wind shear, the system comprising:

an optical sensor configured to sense speed of air relative to an aircraft at a predetermined distance in front of an aircraft; and

a processor coupled to receive the sensed speed of air from the optical sensor, the processor including:

a first component configured to determine whether the speed of the air at the predetermined distance is indicative of wind shear; and

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a second component configured to automatically generated control signals for controlling the aircraft such that the wind shear is automatically compensated by a time the aircraft enters the wind shear.

42. The system of Claim 41, wherein the wind shear includes a microburst.

43. The system of Claim 41, wherein the predetermined distance is greater than 1,000 meters.

44. The system of Claim 43, wherein the predetermined distance is around 10,000 meters.

45. The system of Claim 41, wherein the control signals automatically cause engine thrust to be increased to compensate for the wind shear by a time the aircraft enters the wind shear.

46. The system of Claim 41, wherein the optical sensor includes a laser.

47. The system of Claim 46, wherein the laser includes a laser Doppler velocimeter system.

48. A method for automatically compensating control of an aircraft for wind shear, the method comprising:

optically sensing speed of air relative to an aircraft at a predetermined distance in front of the aircraft;

determining whether the speed of the air at the predetermined is indicative of wind shear; and

automatically compensating control of the aircraft by a time the aircraft enters the wind shear.

49. The method of Claim 48, wherein automatically compensating control of the aircraft includes automatically generating control signals.

50. The method of Claim 48, wherein the wind shear includes a microburst.

51. The method of Claim 48, wherein the predetermined distance is greater than 1,000 meters.

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52. The method of Claim 51, wherein the predetermined distance is around 10,000 meters.

53. The method of Claim 48, wherein automatically compensating control of the aircraft includes automatically increasing engine thrust to compensate for the wind shear by the time the aircraft enters the wind shear.

54. The method of Claim 48, wherein the speed of the air is optically sensed by a laser.

55. The method of Claim 54, wherein the laser includes a laser Doppler velocimeter system.

56. A system for automatically compensating control of an aircraft for turbulence, the system comprising:

a sensor configured to sense speed of air relative to an aircraft at a first predetermined distance in front of the aircraft and at a second predetermined distance that is farther in front of the aircraft than the first predetermined distance; and

a processor coupled to receive the sensed speed of the air from the sensor, the processor including:

a first component configured to determine whether the speed of the air at the first predetermined distance is indicative of turbulence, the first component being further configured to determine whether the speed of the air at the second predetermined distance is indicative of clear air turbulence; and

a second component configured to automatically generate control signals for controlling the aircraft such that the turbulence or the clear air turbulence is automatically compensated by a time the aircraft enters the turbulence or clear air turbulence.

57. The system of claim 56, wherein the control signals automatically cause flight control surfaces to be positioned to compensate for the turbulence by a time the aircraft encounters the turbulence.

58. The system of Claim 56, wherein the control signals automatically cause engine thrust to be increased to compensate for clear air turbulence by a time the aircraft enters the clear air turbulence.

59. The system of Claim 56, wherein the sensor includes an optical sensor.

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60. The system of Claim 59, wherein the optical sensor includes a laser.

61. The system of Claim 61, wherein the laser is multiplexed between a first wavelength for sensing speed of the air at the first predetermined distance and a second wavelength for sensing speed of the air at the second predetermined distance.

62. The system of Claim 59, wherein the optical sensor includes:

a first laser configured to operate at a first wavelength for sensing speed of the air at the first predetermined distance; and

a second laser configured to operate at a second wavelength for sensing speed of the air at the second predetermined distance.

63. The system of Claim 56, wherein the first predetermined distance is less than 1,000 meters and the second predetermined distance is greater than 1,000 meters.

64. The system of Claim 63, wherein the first predetermined distance is around 200 feet and the second predetermined distance is around 10,000 meters.

65. An aircraft comprising:

a fuselage;

a pair of wings attached to the fuselage;

at least one engine;

a plurality of control surfaces; and

a system for automatically compensating control of an aircraft for an environmental condition, the system including:

a sensor configured to sense speed of air relative to an aircraft at predetermined distance in front of the aircraft; and

a processor coupled to receive the sensed speed of air from the sensor, the processor including:

a first component configured to determine whether the speed of the air at the predetermined distance is indicative of an environmental condition; and

a second component configured to automatically generate control signals for controlling the aircraft such that the environmental condition is automatically compensated by a time the aircraft enters the environmental condition.

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66. The aircraft of Claim 65, wherein the control signals automatically cause flight control surfaces to be positioned to compensate for the environmental condition by the time the aircraft enters the environmental condition.

67. The aircraft of Claim 65, wherein the control signals automatically cause engine thrust to be increased to compensate for the environmental condition by the time the aircraft enters the environmental condition.

68. The aircraft of Claim 65, wherein the sensor includes an optical sensor.

69. An aircraft comprising:

a fuselage;

a pair of wings attached to the fuselage;

at least one engine;

a plurality of control surfaces; and

a system for automatically compensating control of an aircraft for turbulence, the system including:

an optical sensor configured to sense speed of air relative to an aircraft at a predetermined distance in front of an aircraft; and

a processor coupled to receive the sensed speed of air from the optical sensor, the processor including:

a first component configured to determine whether the speed of the air at the predetermined distance is indicative of turbulence; and

a second component configured to automatically generate control signals for controlling the aircraft such that the turbulence is automatically compensated by a time the aircraft enters the turbulence.

70. The aircraft of Claim 69, wherein the control signals automatically cause flight control surfaces to be positioned to compensate for the turbulence by the time the aircraft enters the turbulence.

71. The aircraft of Claim 69, wherein the sensor includes an optical sensor.

72. An aircraft comprising:

a fuselage;

a pair of wings attached to the fuselage;

at least one engine;

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a plurality of control surfaces; and

a system for automatically compensating control of an aircraft for wind shear, the system including:

an optical sensor configured to sense speed of air relative to an aircraft at a predetermined distance in front of an aircraft; and

a processor coupled to receive the sensed speed of air from the optical sensor, the processor including:

a first component configured to determine whether the speed of the air at the predetermined distance is indicative of wind shear; and

a second component configured to automatically generated control signals for controlling the aircraft such that the wind shear is automatically compensated by a time the aircraft enters the wind shear.

73. The aircraft of Claim 72, wherein the control signals automatically cause engine thrust to be increased to compensate for the wind shear by the time the aircraft enters the wind shear.

74. The aircraft of Claim 72, wherein the sensor includes an optical sensor.

75. An aircraft comprising:

a fuselage;

a pair of wings attached to the fuselage;

at least one engine;

a plurality of control surfaces; and

a system for automatically compensating control of an aircraft for turbulence, the system including:

a sensor configured to sense speed of air relative to an aircraft at a first predetermined distance in front of the aircraft and at a second predetermined distance that is further in front of the aircraft than the first predetermined distance; and

a processor coupled to receive the sensed speed of the air from the sensor, the processor including:

a first component configured to determine whether the speed of the air at the first predetermined distance is indicative of turbulence, the first component being further configured to determine whether the speed of the air at the second predetermined distance is indicative of clear air turbulence; and

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a second component configured to automatically generate control signals for controlling the aircraft such that the turbulence or the clear air turbulence is automatically compensated by a time the aircraft enters the turbulence or clear air turbulence.

76. The aircraft of Claim 75, wherein the control signals automatically cause flight control surfaces to be positioned to compensate for the turbulence by the time the aircraft encounters the turbulence.

77. The aircraft of Claim 75, wherein the control signals automatically cause engine thrust to be increased to compensate for clear air turbulence by the time the aircraft enters the clear air turbulence.

78. The aircraft of Claim 75, wherein the sensor includes an optical sensor.

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